**Názov cvičenia:**

**Meranie na LED**

**Cieľ:** naučiť žiakov vyhľadať z katalógu potrebné parametre a materiál LED rôznych farieb, odmerať VA charakteristiky týchto diód a skontrolovať s parametrami podľa katalógu

**Úlohy:**

1. Zistite katalógové údaje predložených LED
2. Odmerajte:

* kde má LED dióda anódu a katódu
* VA charakteristiky v priepustnom smere ***IF = f(UF)***

1. Vypočítajte odpor LED v každom meranom bode
2. Zapíšte napätie každej LED, pri ktorom začne svietiť
3. Znázornite graficky odmerané charakteristiky
4. Určte z VA charakteristík prahové napätie diód
5. Porovnajte odmerané parametre s katalógovými údajmi

**Teoretický úvod:** základný princíp LED, používané materiály, výhody, nevýhody a využitie LED

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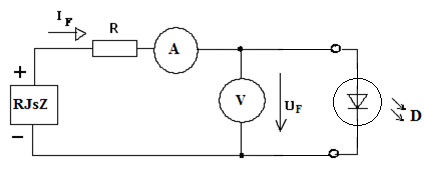
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**Schéma zapojenia:**



**Použité meracie prístroje a pomôcky:**

**RJsZ –** ........................................................................................................................................

**V –** ...........................................................................................................................................

**A –** ............................................................................................................................................

**R –** ochranný odpor, navrhnite podľa typu diódy

Návrh:

***Meraný objekt – LED:***

***Katalógové údaje výrobcu pre jednotlivé LED:***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Názov Farba LED***  ***parametra podľa***  ***katalógu (jednotky)*** | ***Modrá*** | ***Červená*** | ***Zelená*** | ***Biela*** |
| materiál |  |  |  |  |
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***Tabuľky nameraných a vypočítaných hodnôt:***

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Modrá*** | | | ***Červená*** | | | ***Zelená*** | | | ***Biela*** | | |
| ***IF***  *(mA)* | ***UF***  *(V)* | ***Rvyp***  *(Ω)* | ***IF***  *(mA)* | ***UF***  *(V)* | ***Rvyp***  *(Ω)* | ***IF***  *(mA)* | ***UF***  *(V)* | ***Rvyp***  *(Ω)* | ***IF***  *(mA)* | ***UF***  *(V)* | ***Rvyp***  *(Ω)* |
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| *Prahové napätie(V)* | |  | *Prahové napätie(V)* | |  | *Prahové napätie(V)* | |  | *Prahové napätie(V)* | |  |
| *Napätie, pri ktorom začína LED svietiť (V)* | |  | *Napätie, pri ktorom začína LED svietiť (V)* | |  | *Napätie, pri ktorom začína LED svietiť (V)* | |  | *Napätie, pri ktorom začína LED svietiť (V)* | |  |

***Vzorový výpočet:*** *dosaďte jednu hodnotu z tabuľky*

***Postup pri meraní:*** ..............................................................................................................................................

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***Vyhodnotenie:*** nakresliť VA charakteristiky všetkých LED diód, určte prahové napätie jednotlivých LED a zdôvodnite odlišnosti vo veľkosti, porovnajte odmerané a katalógové údaje LED, v prípade odlišnosti zdôvodnite

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